3D NUMERICAL SIMULATION BY UPSCALING OF GAS MIGRATION THROUGH ENGINEERED AND GEOLOGICAL BARRIERS FOR A DEEP REPOSITORY FOR RADIOACTIVE WASTE

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This talk presents the results of a benchmark study that compares a number of numerical models applied to a specific problem in the context of hydrogen flow and transport in a nuclear waste repository. The processes modeled are two-phase (water and hydrogen) immiscible compressible two-component transient flow in a heterogeneous porous medium under isothermal conditions. The three-dimensional model represents a module of a repository for high level waste in a clay host rock. An upscaling technique and a vertex-centred finite volume method are employed to yield very accurate solutions. Since the full range of results required in the benchmark is too large to be displayed in this paper, we focus on the evolution of the pressures, the saturations, the fluxes and the comparison of the numerical results with the other participants. A homemade C++ upscaling code and the parallel multiphase flow simulator DuMu^X have been adopted for this study.

References

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